**WATER, WASTE AND ENERGY SUSTAINIBILITY**

**MIDTERM PAPER**

**SUBMITTED BY: DERYL CHANDLER-MASON**

**SUBJECT: SCIENCE/LIVING ENVIRONMENT**

**DATE: 10/19/13**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**NYS STANDARDS/COMMON CORE:**

***LE7.2b, c; LE7.2d; LE.5.1c, LE6.2a; ICT 5.2; IPS1.1-1.4; IPS2.1***

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**COMPETENCIES BASED ON DANIELSON’S FRAMEWORK:**

**1e: Designing Coherent Instruction 3c: Engaging Students in Learning**

**2b: Establishing a Culture for Learning 3d: Using Assessment in Instruction**

**2c: Managing Classroom Procedures 4a: Reflecting on Teaching**

**3b: Using Questions and Discussions**

**RELATIONSHIP WITH BLOOM’S TAXONOMY:**

**The steps used in this lesson include the following: 1) Information gathering 2) Making use of the knowledge 3) taking apart some of the key facts 4) Judging the outcome (with a debate)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**TITLE: THE SUSTAINABILITY CHALLENGE: MEETING THE NEEDS OF WATER/ENERGY/WASTE-CONSERVING RESOURCES**

**GRADES: 7th and 8th grade: High school level**

**UNIT: ENERGY SOURCES**

**MOTIVATION/BRIDGE: (connecting relevancy to students’ lives): The students have learned about energy and its sources. They participated in conversations and class activities that introduced them to the topic of energy and how it affects the environment that we live in.**

**MATERIALS/RESOURCES: Index cards, worksheets with vocabulary words, newspapers and journals, access to computers**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**ACTUAL LESSON PLAN: The aim is to have students learn about what is energy and how can we have more energy for future use.**

**PERFORMANCE OBJECTIVES: (STUDENT)**

* **Students will learn the vocabulary words.**
* **Students will design a collage about the topic.**
* **Students will gather information about the positive and negative aspects of the energy sources.**
* **Students will conduct research on all of the energy sources.**
* **Students will take a position and present their findings to the class.**

1. **Vocabulary component-(become familiar with terminology)**
2. **What is energy? What are the sources of energy? and What is energy sustainability? The students will be asked these questions.**
3. **On the board, their responses will be written in 3 columns.**
4. **Students will be given a worksheet with the following terms: solar energy, wind energy, hydropower, natural gas, petroleum, biomass**
5. **Students will write the definitions for each term and become familiar with their relationship.**
6. **Students will get into small group and test each other on their new vocabulary words.**
7. **Collage – (this lesson relates to my world/ everyday life)**
8. **Students will work in groups and design a collage mapping out all the sources of energy using magazines and newspapers.**
9. **Students will present to the entire class their explanation of the collage. The collage may have pictures of fossil fuels, wind power, water power and solar energy. It may also have written facts about each source.**
10. **The groups will present their collages and discuss their significance. Each student can present what the activity helped them to learn.**
11. **Comparison- (Good vs. bad effects/ Pros and Cons)**
12. **Students will compare all of the different sources and discuss their beneficial and harmful outcomes.**
13. **Students will work in groups and assigned to work on a particular energy source.**
14. **They can decide what they will name their group. For example, the Solar Energy Group may choose to be called – The “Sunshine” Group.**
15. **Brainstorm- ( Possibilities/options/choices)**
16. **Students will conduct research on their assigned topic. They will have to show evidence of information regarding cost, availability, positive and negative outcomes.**
17. **After they have done the research, the students will write their information.**
18. **They will discuss any possibilities, options or choices that they found during their research.**
19. **Future- (Future ramifications/ What will the world look like?)- RUBRIC (SEE ATTACHMENT)**
20. **Students will have a debate about which source will have better outcome for our future.**
21. **Each group will be given 3-5 minutes to discuss their assigned topic to the entire class.**
22. **After each has presented their case, then the group will decide on which energy source is the best financially, economically and environmentally.**

**ASSESSMENT:**

**The entire group will share their experiences about the lesson. Students will discuss their findings with the class. In addition, I will lead the class in a question and answer period about the subject matter.**

**ENRICHMENT:**

**Students will be able to relate their studies and findings to everyday life.**

**TEACHER NOTE:**

**The student objectives were met. The students in each group were well prepared. They demonstrated that they researched their topic in-depth. There was evidence of great teamwork and great collaboration in each group.**

**TEACHER REFLECTION:**

**This unit was a valuable lesson for the students. They were able to participate in a debate about what the quality of life may look like in the next 10 to 20 years.**

Project-based Learning Rubric

| Score Levels | Content | Conventions | Organization | Presentation |
| --- | --- | --- | --- | --- |
| 4 | * The presentation is well thought out and supports the solution to the challenge * Critical thinking is evident * Each position was researched * The alternative positions are clearly stated | * No spelling, grammatical, or punctuation errors * High-level use of vocabulary and word choice | * Information is clearly focused in an organized and thoughtful manner * Information is constructed in a logical pattern to support the solution | * The group understands the information completely for each position * Reasons for not supporting a position are clearly stated * Presentation captures audience attention * Presentation is organized and well laid out |
| 3 | * The presentation Is well thought out and supports the solution * Positions researched * Alternative positions were presented | * Few (1 to 3) spelling, grammatical, or punctuation errors * Good use of vocabulary and word choice | * Information supports the solution to the challenge or question | * Some group members understand the information * Support for a position * Presentation captures audience attention * Presentation is well organized |
| 2 | * The solution was supported * Some research was done * Limited information about alternative positions | * Minimal (3 to 5) spelling, grammatical, or punctuation errors * Low-level use of vocabulary and word choice | * Project has a focus but might stray from it at times * Information appears to have a pattern, but the pattern is not consistently carried out in the project * Information loosely supports the solution | * The group presented incorrect information * Minimal support for a position * Presentation does not capture audience attention * Presentation is loosely organized |
| 1 | * Provides inconsistent information for solution * Minimal amount of research done | * More than 5 spelling, grammatical, or punctuation errors * Poor use of vocabulary and word choice | * Content is unfocused and haphazard * Information does not support the solution to the challenge * Information has no apparent pattern | * Presentation appears sloppy and/or unfinished * Audience was inattentive * Lack of organization |